Caffeine Excretion Rates of a Single Dose of 300 Milligrams in College Students

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Introduction

- Caffeine, 3 to 6 mg/kg, demonstrates ergogenic benefits
- NCAA limits caffeine to less than 15 µg/ml in urine
- The amount of caffeine an individual can consume before reaching the legal limit is unclear

Purpose

- To assess the rate of caffeine excretion in different individuals using a single dose of 300 mg

Methods

- IRB approved this research and students (n=19) signed informed consents
- 300 mg of caffeine was provided with 12 oz. of Crystal Light
- Urine samples were collected 1, 2, 3, and 4 hours post consumption
- Specific gravity and urine volumes were recorded
- Caffeine was analyzed using an ELISA Assay
- An online survey link was emailed to students assessing physical activity and caffeine use
- Repeated one-way ANOVA and bivariate analysis was used to assess significance

Results

- Five females (148.2 +/- 6.6 lbs.) exceeded the NCAA upper limit of 15 µg/ml; dose was approximately 4.5 mg of caffeine/kg
- Participants stayed well-hydrated through testing (specific gravity: 1.0053-1.0075)
- Caffeine excretion and urine volume were negatively correlated (p = 0.011)
- 89.2% of individuals (n=351) use caffeine, but only 9.7% of the respondents reported using a pre-workout supplement and only 11% use caffeine for ergogenic benefits
- Males were more likely than females to use caffeinated pre-workout supplements and use caffeine to enhance performance (16% males; 4% females)

Conclusions

- A dose of 300 mg of caffeine resulted in 21.5% of the individuals exceeding the 15 µg/ml of urine NCAA threshold, approximately the content of a 16 oz. Starbucks coffee

Acknowledgements

I would like to thank Dr. Michael Gass, and Randy Hammond for all their help and support with my research